

# Nasal Foreign Body: An Unexpected Discovery

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Nasal foreign bodies may result from the abundant availability of tiny objects in our society and a curious child exploring his or her nasal cavities. An inserted object that is not witnessed or retrieved can remain relatively asymptomatic or cause local tissue damage and potentially yield more serious consequences. An unusual case of a young child who presented for dental rehabilitation under general anesthesia is described. Immediately prior to the nasotracheal intubation, an unanticipated foreign body was detected and safely removed before any injury occurred. This case report discusses the presentation and pathophysiology of nasal foreign bodies. Moreover, applicable suggestions are provided to aid in the prevention and management of the unexpected discovery of a nasal foreign body after the induction of general anesthesia.

**N**asal foreign bodies (NFBs) have the potential to yield significant morbidity. An unusual case of a young child who presented for dental rehabilitation under general anesthesia is described. Immediately prior to the nasotracheal intubation, a foreign body was discovered and retrieved before any considerable injury occurred. This case report highlights the event, discusses the presentation and pathophysiology associated with NFBs, and provides pertinent suggestions for the prevention and management of such an unexpected incident.

## CASE DESCRIPTION

A 4-year-old boy presented for dental rehabilitation. Due to his extensive dental decay and poor cooperation to receive the necessary treatment, his mother agreed to have the required procedures performed under general anesthesia. During the review of his medical history, his mother reported that he had experienced intermittent episodes of epistaxis for the past 3 months. However, the etiology had not yet been established by his primary care physician. There was no history of any trauma, no existing hematologic issues, and his laboratory work up revealed no

abnormalities. His medical history was otherwise unremarkable. He had not experienced general anesthesia previously, and no family member had ever had an adverse reaction to anesthesia. He took no medications and had no known drug allergies. He weighed 17 kg and measured 100 cm in height. Upon inspection, he had a Mallampati Class I airway and his oropharynx appeared normal. His lungs were clear to auscultation bilaterally, and his heart demonstrated a regular rate and rhythm. The child had abided appropriately to the standard nothing-by-mouth dietary guidelines. After we explained the benefits and risks of nasotracheal intubated general anesthesia, parental informed consent was obtained.

The patient was brought to the operating room along with his mother and placed supine on the operating room table. Standard ASA monitors were placed. A smooth mask induction of anesthesia was performed with sevoflurane, oxygen, and nitrous oxide. After induction, the patient's mother was escorted from the room and intravenous access was established with a 22-gauge catheter in the dorsum of the patient's left hand. The patient continued to spontaneously breathe sevoflurane and was preoxygenated with 100% oxygen. A small bolus of propofol was administered intravenously to assist in the intubation process. Once the patient had become apneic, the mask was removed, the patient's eyes were protected with tape, and water-soluble lubricant was placed at the orifice to the right naris. A 4.0-mm, straight-cuffed endotracheal tube (ETT) that had been previously softened in warm water

Received May 11, 2011; accepted for publication June 8, 2011.

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Anesth Prog 58:121–123 2011

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ISSN 0003-3006/11

SSDI 0003-3006(11)



**Figure 1.** Nasally intubated child.

was inserted gently into the right naris. Minimal resistance was encountered as the tube was advancedatraumatically into the hypopharynx. The patient's mouth was opened, and a Macintosh #2 laryngoscope blade was used to visualize the larynx. A dark, unidentifiable object that did not resemble any anatomic structure was situated in an area posterior to the vocal cords and anterior to the esophagus. Magill forceps were cautiously utilized to grasp the object and carefully remove it from the patient. Subsequently, the ETT was advanced with these forceps through the vocal cords and into the trachea. Upon ventilation, equal bilateral breath sounds were heard, and positive end-tidal carbon dioxide tracings were verified. The tube was secured with tape, and the procedure and anesthetic proceeded uneventfully (Figure 1).

The retrieved object was star-shaped, measured approximately 2.3 cm in diameter, and consisted of a thin rubbery material (Figure 2). At the completion of the procedure, the patient was extubated and brought to the recovery room, where he was discharged after a routine recovery period. During his recovery, the patient's mother was informed of this unusual intraoperative finding. She appeared relieved, nodding knowingly that this object was most likely the cause of his mysterious episodes of epistaxis. Postoperatively, the patient's mother reported that he had no adverse sequelae from the dental procedure. Except for an isolated episode of nose bleeding 2 days after the dental procedure, his mother stated that for the 7 months after this anesthetic, his epistaxis occurrences had completely resolved.

## DISCUSSION

The curiosity of a child who explores his or her nasal cavities, coupled with the plethora of tiny inert and



**Figure 2.** Retrieved nasal foreign body.

natural objects in our society, can produce a dangerous outcome. NFBs can be situated in any portion of the nasal cavity. Usually they are found around the floor of the nose just below the inferior turbinate. Another common location is immediately anterior to the middle turbinate. NFBs have been found to occur predominantly in the first 4 years of a child's life. In one study, about half of incidents transpired in patients between birth and 2 years of age, and more than a third of cases occurred in patients between the ages of 2 and 4 years.<sup>1</sup> Unilateral foreign bodies were found to affect the right side about twice as often as the left. This finding may be due to a greater incidence of right-handed people in the general population and a preference of these individuals to insert objects in their right naris.<sup>1</sup> Two studies consistently found that more males (56%–58%) than females (42%–44%) present with NFBs.<sup>2,3</sup> NFBs are categorized as either inorganic or organic objects. Inorganic items typically consist of metal or plastic. Examples include small parts from toys, beads, and jewelry. Some inorganic objects can become more destructive than others when lodged inside the nose. For example, button batteries found in many small electronic devices and toys can cause nasal cavity burns within a few hours.<sup>4</sup> Organic NFBs include such items as food, rubber, wood, and sponges and tend to be more irritating to the nasal mucosa than inorganic objects. Because many organic NFBs can absorb water from the local tissues, a brisk inflammatory reaction may ensue, culminating in an earlier symptomatic presentation than inorganic NFBs.<sup>5</sup> Initially, NFBs produce local inflammation that can generate a pressure necrosis, which in turn can lead to mucosal ulceration and erosion into blood vessels, producing epistaxis. Usually the morbidity is minimal, but if these objects become displaced posteriorly and enter the lower respiratory tract, calamitous circumstances can occur.

In most cases, the insertion of a NFB is a witnessed event; however, the event is not always witnessed and may not be reported by a child who is afraid to inform anyone. In one study, presentations over 48 hours after the time of insertion accounted for 14% of all cases.<sup>6</sup> NFBs can become imbedded in calcareous concretions, remaining asymptomatic and unnoticed for weeks or months.<sup>7</sup> If the correct diagnosis is missed initially, the foreign body may not be detected for days, weeks, or even years. One case report described a patient who at the age of 5 or 6 years introduced a foreign body into his right nasal cavity. It remained there until the age of 37. After his presentation with symptoms of a strong fetid smell for 4 years and difficulty breathing through his right nostril for 10 years, it was removed under general anesthesia.<sup>8</sup>

In our specific case, before the procedure, the patient's oropharynx remained clear upon inspection. Perhaps if the nasal passages had been thoroughly visualized before the induction of anesthesia, the object would have been noticed. That was not attempted, but many patients of this age are not cooperative for a thorough inspection of the nose. Moreover, in his diagnostic work up, the patient's physician had apparently already examined him in this manner. This NFB topic was also considered in the case report of another dental case performed under general anesthesia. In that particular case, a blind nasal intubation occurred and a plastic calculator key was unexpectedly discovered and successfully retrieved. The author proposed that all nasal passages be inspected before induction. It should be noted that a significant portion of the nasopharynx remains invisible to superficial inspection.<sup>9</sup> One suggestion for minimizing the dislodgement of an asymptomatic NFB towards the vocal cords, during a nasal intubation by the ETT itself, is to use a suction catheter as an obturator. Pirotte and Ikabu<sup>10</sup> describe the employment of a close-fitting suction catheter (diameter in French  $\sim$ [ETT inner diameter  $\times$  3] – 2) lubricated with silicone and inserted into the ETT together through the nose and carefully slipped into the posterior pharynx. The suction catheter, withdrawn from the ETT before passage through the glottis, acts

as a pathfinder in the nasal cavity and avoids clogging the ETT with mucous, blood, adenoidal tissue, a piece of turbinate, or an unknown foreign body. Also, the catheter can suction a foreign body in a cephalad direction and prevent it from being pushed caudally.

In summary, the combination of obtaining a thorough medical history; questioning a parent or guardian about whether the child has had any abnormal, unexplained nasal symptoms, such as epistaxis; and examining the patient's nasal passages before administering anesthetic can help minimize the unexpected discovery of a NFB after the induction of anesthesia.

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